National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 9712B (DSI-9712B)

Last Spring and First Fall Freeze Dates, 1951-1980

December 26, 2002

National Climatic Data Center
151 Patton Ave.
Asheville, NC 28801-5001 USA

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1. Abstract: The major parameters that make up the Freeze Date file are dates (year, month, day) of the last occurrence in Spring and the first occurrence in Fall where temperatures were less than or equal to 36, 32, 28, 20, and 16 degrees Fahrenheit. The selection of freeze dates was performed for 3,240 stations in the United States (including Alaska and Hawaii) for the 1951-1980 period. The stations were selected from the 1951-1980 Climate Normals station list (DSI-9641). The Spring and Fall distributions in this data set were then used to produce freeze dates and growing season lengths associated with specified probability levels (10, 20, 30, 40, 50, 60, 70, 80, 90 percent). These are available in the digital file 1951-80 Probability Levels for Freeze Dates and Growing Season Lengths (DSI-9712c).

Data from the NCDC Summary of the Day (SOD) file (DSI-3200) were used in producing the Freeze Data dates. The SOD temperature data were put through extensive validation and interpolation procedures based upon the departure from the normal in conjunction with those from surrounding stations. As a result, the freeze data were produced from high quality, serially-complete station records of daily temperatures (Steurer, 1985). This alleviated the many possible biases or errors associated with developing freeze data statistics from an incomplete and lower quality data set.

Yearly station values of the last Spring and first Fall occurrence of selected low temperatures were chosen for the period 1951 through 1980. The low temperature thresholds were the values of 36, 32, 28, 24, 20, and 16 degrees Fahrenheit. All freeze dates were based upon the season August 1 through July 31 for each threshold temperature. Last Spring dates of occurrence were chosen for the period August 1 of the previous year through July 31 of the selected year (e.g., Spring season for 1961 runs from August 1, 1960 through July 31, 1961. However, the year 1951 begins on January 1, 1951). First Fall dates of occurrence were chosen for the period August 1 of the selected year through July 31 of the next year (e.g., Fall season for 1961 runs from August 1, 1961 through July 31, 1962. However, the year 1980 ends on December 31, 1980).

The season definition is an improvement over that previously used when the selection of freeze dates was performed for data from the 1931-1960 period (DSI-9712a). During the 1931-1960 period freeze dates were selected using a six month season definition ending with June 30 for the last Spring freeze and beginning with July 1 for the first Fall freeze. The new season definition coincides more closely with the annual march of temperature in which the warmest time of year occurs closer to August 1. The change of season definition is expected to produce more realistic dates in the extreme northern and mountainous regions of the United States where temperatures frequently are at the threshold temperatures near the June 30 date. However, it is important to note that the change of season definition should have no effect on other station where temperatures do not reach or exceed the preselected temperature during the summer.

2. Element Names and Definitions:

The data are archived in a fixed length ASCII format. The total data volume is 10 megabytes. The data are sorted by the state number (ISTATE) as the primary key followed by station number (ISTATN), and year (IYEAR) as secondary keys.

Element	Type	Width	Start Column	End Column
ISTATE	Integer	2	1	2
ISTATN	Integer	4	3	6
IDIV	Integer	2	7	8
IYEAR	Integer	4	9	12
ISPRNG(1)	Integer	8	13	20
ISPRNG(2)	Integer	8	21	28
ISPRNG(3)	Integer	8	29	36
ISPRNG(4)	Integer	8	37	44
ISPRNG(5)	Integer	8	45	52
ISPRNG(6)	Integer	8	53	60
IFALL(1)	Integer	8	61	68
IFALL(2)	Integer	8	69	76
IFALL(3)	Integer	8	77	84
IFALL(4)	Integer	8	85	92
IFALL(5)	Integer	8	93	100
IFALL(6)	Integer	8	101	108

Element Name	Element Definition
ISTATE	Characters 1-2 Cooperative State code number. Range 01-48, 50, 51
ISTATN	Characters 3-6 Cooperative Station code number. Range 0001-9999.
IDIV	Characters 7-8 Cooperative Division code number. Range 01-10.
IYEAR	Characters 9-12 This is the year of the occurrence of the last Spring or first Fall freeze season within the specified threshold. (E.g., Spring season for 1961 runs from August 1, 1960 through July 31, 1961; except for 1951 which began on January 1, 1951). (E.g., Fall season for 1961 runs from August 1, 1961 through July 31, 1962; except 1980 which ends on December 31, 1980). Range 1951-1980.
LAST-SPRING-FREEZE-36	Characters 13-20
ISPRNG(1)	This is the date (year/month/day) of the occurrence of the last Spring freeze where the temperature was less than or equal to 36 degrees Fahrenheit. The last Spring dates are chosen from the period August 1 of the previous year to July 31 of the selected year. (E.g., Spring freeze period for 1961 runs from August 1, 1960 through July 31, 1961.) A value of "0" indicates no minimum temperature reached or exceeded a freeze threshold for the specified year. Year - 4 characters, Range 1951-1980 Month - 2 characters, Range 01-12

Day - 2 characters, Range 01-31

LAST-SPRING-FREEZE-32 Characters 21-28
ISPRNG(2) This is the date (year/month/day) of the occurrence of the last Spring freeze where the temperature was less than or equal to 32 degrees Fahrenheit.

LAST-SPRING-FREEZE-28 Characters 29-36
ISPRNG(3) This is the date (year/month/day) of the occurrence of the last Spring freeze where the temperature was less than or equal to 28 degrees Fahrenheit.

LAST-SPRING-FREEZE-24 Characters 37-44
ISPRNG(4) This is the date (year/month/day) of the occurrence of the last Spring freeze where the temperature was less than or equal to 24 degrees Fahrenheit.

LAST-SPRING-FREEZE-20 Characters 45-52
ISPRNG(5) This is the date (year/month/day) of the occurrence of the last Spring freeze where the temperature was less than or equal to 20 degrees Fahrenheit.

LAST-SPRING-FREEZE-16 Characters 53-60
ISPRNG(6) This is the date (year/month/day) of the occurrence of the last Spring freeze where the temperature was less than or equal to 16 degrees Fahrenheit.

FIRST-FALL-FREEZE-36 Characters 61-68
IFALL(1) This is the date (year/month/day) of the occurrence of the first Fall freeze where the temperature was less than or equal to 36 degrees Fahrenheit. The first Fall freeze dates are chosen from the period August 1 of the selected year to July 31 of the next year. (E.g., the Fall freeze period for 1961 runs from August 1, 1961 through July 31, 1962; except for 1980 which ends on December 31, 1980).

FIRST-FALL-FREEZE-32 Characters 69-76
IFALL(2) This is the date (year/month/day) of the occurrence of the first Fall freeze where the temperature was less than or equal to 32 degrees Fahrenheit.

FIRST-FALL-FREEZE-28 Characters 77-84
IFALL(3) This is the date (year/month/day) of the occurrence of the first Fall freeze where the temperature was less than or equal to 28 degrees Fahrenheit.

FIRST-FALL-FREEZE-24 Characters 85-92
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IFALL(4)	This is the date (year/month/day) of the occurrence of the first Fall freeze where the temperature was less than or equal to 24 degrees Fahrenheit.
FIRST-FALL-FREEZE-20	Characters 93-100
IFALL(5)	This is the date (year/month/day) of the occurrence of the first Fall freeze where the temperature was less than or equal to 20 degrees Fahrenheit.
FIRST-FALL-FREEZE-16	Characters 101-108
IFALL(6)	This is the date (year/month/day) of the occurrence of the first Fall freeze where the temperature was less than or equal to 16 degrees Fahrenheit.

3. **Start Date**: 19510101

4. **Stop Date**: 19801231

5. **Coverage**: contiguous United States

   a. Southernmost Latitude: 18N
   b. Northernmost Latitude: 65N
   c. Westernmost Longitude: 160W
   d. Easternmost Longitude: 65W

6. **How to Order Data**:

   Ask NCDC's Climate Services about the cost of obtaining this data set.
   Phone: 828-271-4800
   FAX: 828-271-4876
   E-mail: **NCDC.Orders@noaa.gov**

7. **Archiving Data Center**:

   National Climatic Data Center
   Federal Building
   151 Patton Avenue
   Asheville, NC 28801-5001
   Phone: (828) 271-4800.

8. **Technical Contact**:

   National Climatic Data Center
   Federal Building
   151 Patton Avenue
   Asheville, NC 28801-5001
   Phone: (828) 271-4800.

9. **Known Uncorrected Problems**: None.

10. **Quality Statement**: Data from the NCDC Summary of the Day (SOD) file (DSI-3200) were put through a vigorous quality control prior to producing the Freeze Data. These temperature data were put through extensive validation and

interpolation procedures based upon the departure from the normal in conjunction with those from surrounding stations. As a result, the freeze data were produced from high quality, serially-complete station records of daily temperatures. This alleviated the many possible biases or errors associated with developing freeze data statistics from an incomplete and lower quality data set. The serially complete data for the 1951-1980 period are archived in DSI-9641B.

11. Essential Companion Datasets: The use of NCDC's Station History file (DSI-9767) is required in order to determine metadata on each station (name, location, elevation, etc.). This can be accomplished by comparing the station number in bytes 1 through 6 of this data set with the corresponding station number in the Station History data set.

12. References:

Environmental Information Summaries C-26 - Climatography of the United States No. 20

Koss, W.J., Owenby, J.R., Steurer, P.M., and Ezell, D.S., 1988: Freeze/Frost data, Climatography of the U.S. No. 20, Supplement No. 1. National Oceanic and Atmospheric Administration, NCDC, Asheville, NC. 186 pp.

Steurer, P.M., 1985: Creation of a serially complete data base of high quality maximum and minimum temperatures. Unpublished document, NOAA, National Climatic Data Center, Asheville, NC, 21 pp.

Thom, H.C.S. and Shaw, R. H. 1958: Climatological analysis of freeze data for Iowa. Monthly Weather Review, 86, 251-257.

Thom, H.C.S., 1959: The distribution of freeze-date and freeze-free period of climatological series with freezless years. Monthly Weather Review. 87, 136-144.

Vestal, C.K., 171: First and last occurrence of low temperatures during the cold season. Monthly Weather Review, 99,650-652.